LA-UR-22-25311

Approved for public release; distribution is unlimited.

Title:	Operational and Mission Highlights A Monthly Summary of Top Achievements May 2022
Author(s):	Anaya, Lillian Marie Adkins, Kenneth Brian
Intended for:	Monthly Newsletter
Issued:	2022-06-07

LA-UR-22-XXXXX

Operational and Mission Highlights

A MONTHLY SUMMARY OF TOP ACHIEVEMENTS

May 2022

Contents

COMMUNITY RELATIONS

NUCLEAR SECURITY

ALT939 Cables Shipped as ALT941 Components Receive Diamond Stamp Delegation to Production Agency Quality

On April 26, 2022 the Mark Quality Manufacturing Center at Prototype Fabrication completed its first shipment of ALT941 bottles for the B61-12 that were diamond stamped by LANL Production Agency Quality staff after receiving full delegation authority from Los Alamos Site Office. This represents a significant accomplishment that will help forge a path for future products. This authority delegation is a result of steady and consistent manufacturing performance that will enable streamline product sale activities for the institution.

Also in the Nonnuclear Production space, two ALT939 DEV#1 functional cables were completed and shipped by their deadline of April 28, 2022. When Detonator Production teams completed manufacturing on two ALT939 DEV#1 functional cables, the first development units to be produced in this lot, electrical testing failed. Employees sent the cables for further electrical testing, and found that the root cause had to do with the connectors. This was a challenging issue to trouble shoot but the team, which included Detonator Production, E-6, and Sandia employees, worked together using conduct of operations principles and solved the issue in time to make the shipping deadline.

ARIES Pit Cutter Goes Into Operation in Support of Nonproliferation Missions

The ARIES Pit Cutter at TA-55's Plutonium Facility went into operation on April 27, 2022. The ARIES program, which stands for Advanced Recovery and Integrated Extraction System, takes surplus plutonium components and converts the plutonium metal into an oxidized powder form. That powder form makes the material much more difficult for adversaries to use in weapons production. The ARIES team has been practicing for months to execute the first evolution of bisecting a pit, and it showed. The process was seamless and the equipment worked exactly as designed. The construction, preparation, and startup was a significant team effort over the course of many years, reflecting the institutional gains made through restructuring in support of increased collaboration. Teams supporting this effort included the ARIES group, E-Division, Nuclear Criticality Safety, Plutonium Infrastructure, Radiological Protection, and Engineering Services. The pit cutter provides the critical capability to add additional items to the feed list for ALDWP and the Lab's nuclear nonprolisferation mission.

Laboratory Completes Second Successful Spall Test on Pit

The second pit spall test was successfully conducted on CERT-00 pit the week of April 11, 2022, at the Laboratory. The spall tests, which are high-rate strength tests to certify the material in the pit is meeting the specifications from the design agency, are essential to meeting the first production unit (FPU) pit.

A quick review showed excellent data return and a preliminary analysis revealed good quality wave profile data. The data was submitted to Lawrence Livermore National Laboratory (LLNL), which is the design agency.

This experiment was the second since early March 2022, demonstrating institutional gains, coordination, and collaboration between various groups across the Laboratory, including the Pit Technologies (PT) division, the Production Agency Quality (PAQ) division, the Nuclear Materials Science (MST-16) group, the Shock and Detonation Physics (M-9) group, and LLNL.

The Laboratory has worked over the past three years to modernize the TA-55 40-mm-gun diagnostics suite, including installation of new digitizers, interferometer cavities, lasers, and detectors.

Weapons Engineering 'Instant Hire' Job Fair Nets Top-Tier Talent from TAMU

The Associate Laboratory Directorate for Weapons Engineering's (ALDW) Pipeline Committee recently conducted an impressive 43 job interviews, offering 31 positions on the spot to prospective hires at a special Texas A&M University (TAMU)-sponsored "instant hire" job fair in College Station, Texas.

The event was developed between ALDW and TAMU Senior Associate Vice Chancellor for National Laboratories and National Security Strategic Initiatives Diane Hurtado specifically to identify engineering students whose interests and fields of study align with ALDW's mission. The rapid-fire career fair concept was then applied to quickly fill vacancies and supply brainpower virtually overnight. So far, of the 31 job offers made,

ALDW has officially hired eight regular employees and is awaiting formal acceptance and start dates for another five. The associate directorate also completed nine student packages, and another eight resumes were passed directly to other Laboratory organizations for consideration.

Created in-house in August 2021 and chaired and staffed by representatives from across all ALDW divisions, the ALDW Pipeline Committee has deployed resources to 35 recruiting events so far in 2022 to help synthesize the associate directorate's aggressive staffing plan, which seeks to address loss of staff from attrition and meet increasing demands for a highly skilled employee base that can tackle challenges presented by the Laboratory's ever-accelerating Weapons mission.

Future events like this one are now being considered at places like Montana State University, Brigham Young University, and other top-tier engineering schools in the country.

Weapons Production Completes Pit Disassemblies Ahead of Schedule

Careful planning and agility helped the Pit Technologies (PT) Division complete disassembly of Advanced Recovery and Integrated Extraction System (ARIES) pits ahead of schedule. The schedule called for four ARIES disassembles in fiscal year 2022. The Machining Group (PT-2), in collaboration with the Actinide Material Processing and Power (AMPP) Division, completed one of the disassemblies prior to the April 2022 inventory. The ARIES program converts plutonium metal from old pits that could be used to make nuclear weapons into plutonium oxide powder, which cannot be used in nuclear weapons. ARIES supports the nation's nuclear nonproliferation commitments by helping to prevent the spread of weapons-grade nuclear material. All disassemblies were completed without any impacts to pit production or surveillance schedules. PT-2 used the April 2022 inventory period to get two additional disassemblies completed. The fourth and final disassembly for the fiscal year was completed on May 5, 2022, shortly after the April 2022 inventory, which was significantly shorter than expected. The shorter inventory duration was a result of disciplined operations in material control and accountability in PT and AMPP, as well as strong integration and collaboration with SAFE-Nuclear Material Control and Accountability (NMCA).

SCIENCE, TECHNOLOGY, AND ENGINEERING

Amy Lovell Receives FRIB Achievement Award for Early Career Researchers

The Facility for Rare Isotope Beams (FRIB) Achievement Award for Early Career Researchers recognizes outstanding original contributions to the field of nuclear physics through work at or relating to FRIB, performed by scientists early in their careers. Amy Lovell of Nuclear & Particle Physics, Astrophysics and Cosmology (T-2) is the recipient of the 2022 theory award for her work on Bayesian optimization and uncertainty quantification for optical model potentials, as well as propagation of uncertainties to reaction observables.

Curiosity Reports Back on 'Most Chemically Diverse Part' of Gale Crater on Mars

The first analysis of the Glen Torridon region in the Gale crater on Mars shows that bedrock in the area was changed by groundwater in the planet's early history, which has important implications for understanding past habitability and the possibility of finding past life on Mars. The findings, published in a special issue of *Journal of Geophysical Research Planets*, describe some of the first results from the Glen Torridon region.

The primary reason that the rover was sent to Mars was to investigate this region so researchers can understand the transition from an early warm and wet Mars to a cold and dry one. This region most likely represents the last stages of a wet Mars, and studying it will help scientists understand the lake sediments in order to provide a baseline for what happened right before Mars' climate changed. It was a very active time in Mars' history.

The NASA Curiosity rover explored the ancient lakebed rocks within the Glen Torridon region from January 2019 to January 2021. During that time, the rover observed signs that the bedrock was changed by groundwater, especially in the higher elevations along the rover's path. The rover also discovered a surprisingly high number of nodules, veins, and other features related to water alteration of the bedrock.

The research team used data from the rover's ChemCam instrument, which was developed at Los Alamos and CNES (the French space agency), to record chemistry and images from the four cameras on the rover in

order to look for physical and chemical changes to the rocks.

Climate Change Will Force Big Shift in Timing, Amount of Snowmelt Across Colorado River Basin

New research by a LANL team predicts that changes in mountain snowmelt will shift peak streamflows to much earlier in the year for the vast Colorado River Basin, altering reservoir management and irrigation across the entire region. The paper was published in the journal *Earth and Space Science*.

Because of global climate change, areas of Colorado, Utah, and Wyoming could have much less water, and future hydrologic conditions may more closely resemble those of the arid Southwest regions of the basin today.

The basin stretches from sea level at the Gulf of California to higher than 14,000 feet in the Rocky Mountains of Colorado and provides critical water to cities and farmers within the basin and beyond. Significant water is diverted to large population centers, including Albuquerque, Denver, Los Angeles, Salt Lake City, San Diego, and Santa Fe.

Using artificial intelligence, the study predicts snowmelt disappearing entirely in some sub-watersheds and large snowpack losses in others.

The team also found that higher-elevation areas of the basin are projected to see a large loss of snowpack as temperatures continue to rise. Particularly in the Rocky Mountains of the upper Colorado River Basin, the team found distinct variations in how much the seasonality and intensity of future runoff will change.

CNLS Hosts 4th Annual Physics-Informed Machine Learning Conference

The Center for Nonlinear Studies hosted the fourth edition of its Physics Informed Machine Learning conference, May 11–13, 2022, at the La Fonda Hotel in Santa Fe. The conference featured continued discussions and explorations from the previous years and continued leveraging of the deep connection between machine learning and physics, but with a goal of better understanding and modeling physical systems, both static and dynamic.

Topics discussed in depth were:

- Theory and Methods—deep learning, graphical models, optimization, dynamical systems, and statistical learning
- Algorithms and Applications—physics, computer science, biology, turbulence, quantum chemistry, materials, and quantum computing

Devin Francom of CCS-6 Named ASC V&V-UQ Project Leader

Devin Francom of Statistical Sciences (CCS-6) was named the Advanced Simulation and Computing (ASC) Verification and Validation Uncertainty Quantification (V&V-UQ) project leader. Devin earned his Ph.D. in statistics and applied mathematics from UC Santa Cruz in 2017. As a graduate student, he conducted UQ research at both the National Center for Atmospheric Research and Lawrence Livermore National Laboratory. Since becoming a CCS-6 staff member in 2017, he has worked on UQ projects from many scientific domains, including material strength, geomechanics, technical nuclear forensics, and storm surge modeling. His expertise is in Bayesian methods for emulation, sensitivity analysis, and inversion of computer models.

Improved Scattering Model Increases Fidelity of ElectroStatic Discharge (ESD) Simulations

In FY'21, the ASC-PEM atomic project joined forces with LANL's weapons system safety group in developing tools for a physics-based re-evaluation of the ESD-guidelines. A well-recognized obstacle to predictive air-gap ESD simulations stems from deficiencies in the modeling of scattering processes. Recently, an ASC-atomic effort has overcome some of the elastic scattering challenge through the calculation and implementation of accurate (adjustment-free) cross-sections for a Helium plasma. The results of this effort represent an important step forward in the development of a new capability for understanding electric discharge in weapons dismantlement.

Contributors to this project include James Colgan, Ryan Park, and Mark Zammit of Physics and Chemistry of Materials (T-1), and Nathan Garland and Xianzhu Tang of Applied Mathematics and Plasma Physics (T-5).

New Research Could Provide Earlier Warning of Tsunamis

A new method of detecting mega earthquakes, which picks up on the gravity waves they generate by using deep-learning models created at Los Alamos National Laboratory, can estimate earthquake magnitude in real time and provide earlier warning of tsunamis.

The model unlocks real-time estimation of earthquake magnitude using data routinely treated as noise, and can immediately be transformative for tsunami early warning.

Rapid and reliable magnitude estimation for large earthquakes is crucial to mitigate the risk associated with strong shaking and tsunamis. Standard early warning systems based on seismic waves cannot rapidly estimate the size of large earthquakes; the systems rely on estimating earthquake magnitude directly from the shaking it produces. These systems cannot distinguish between magnitude 8 and magnitude 9 earthquakes, even though the latter is 30 times more energetic and destructive.

In new research, published May 11, 2022 in Nature, a research team found that a long-theorized gravity wave associated with very large earthquakes can also be used for earthquake early warning. Unlike seismic-based early warning, gravity-based early warning does not saturate with magnitude, meaning that gravity-based earthquake early warning can immediately distinguish between magnitude 8 and 9 earthquakes.

This model, combined with real-time data, can alert communities much earlier if a subduction mega earthquake is large enough to create a tsunami that will breach the seawalls in place and endanger the coastal populations.

Validation Brings New Predictive Capability to Global Megafire Smoke Impacts

New research modeling smoke from two recent megafires sets the stage for better forecasting of how emissions from these global-scale events will behave and affect temperatures. As huge wildfires become more common under climate change, increased attention has focused on the intensity and duration of their emissions, which rival those of some volcano eruptions.

According to Gennaro D'Angelo of Fluid Dynamics and Solid Mechanics(T-3), a co-author on the paper, as fire regimes change and enter new paradigms of behavior under future climate change, data from past fires cannot be used for prediction and assessment. The paper "Contrasting Stratospheric Smoke Mass and Lifetime from 2017 Canadian and 2019/2020 Australian Megafires: Global Simulations and Satellite Observations," was published in the *Journal of Geophysical Research*.

MISSION OPERATIONS

20-Minute Work Pause May Have Prevented an Accident

The initiative of a manager passing by a job site may have prevented someone from falling. The manager's willingness to step in and pause work certainly increased the crew's understanding of scaffolding safety.

The crew had set up the scaffolding to perform preventive maintenance work on a combustion gas turbine generator on the Lab's main campus. The manager saw a worker who was higher than four feet above the ground without any fall protection.

That manager, Nick Nelson, did exactly the right thing and paused the work for about 20 minutes to discuss fall safety with the crew. He had seen a worker standing about 15 feet above the ground on a horizontal, load-bearing beam without any fall protection and away from the scaffolding.

Nelson explained to the crew that any work above four feet from the ground requires fall protection equipment or a worker must be standing on the scaffolding. The workers had misunderstood the scaffolding requirements. The pause was lifted once it was clear that everyone understood the requirement, said Nelson of the Utilities and Infrastructure Division. Through a learning team, the safety message was shared with a larger Lab audience.

Lab employees in Facilities and Operations are sharing lessons learned and fostering disciplined operations. The aim is to achieve operational and programmatic excellence. As employees put the philosophy into practice, these behaviors become second nature. The behaviors also form the basis of a safe and successful workforce.

ASM Named Award Winner and Finalist for Procurement Awards, Putting the Lab on the Global Map for Procurement Excellence

With its major transformation initiative well underway, Acquisition Services Management (ASM) Division has taken steps to ensure positive progression with newly implemented processes and systems. After the implementation of SAP Ariba in June 2021, the division has been recognized by two leading procurement industry authorities.

Classified Network Users at Los Alamos, Sandia, and Lawrence Livermore Can Now Collaborate Across Institutions Online

Recently, Los Alamos National Laboratory's Information and Technology (I&T) organization partnered with Sandia National Laboratory and Lawrence Livermore National Laboratory for a new Red Network online collaboration. Employees at the three institutions can now collaborate with each other on the Red Network through their respective collaboration platforms. Users at Los Alamos and Sandia can communicate using Skype for Business. Users at Lawrence Livermore can communicate using Jabber.

This new communication tool enhances disciplined operations at Los Alamos, making collaboration with peers across the complex easier and more efficient.

CMRR Team Receives FORR Report for Recategorizing the RLUOB as an HC-3 Nuclear Facility

On May 13, 2022, the Laboratory received the final report for the Radiological Laboratory Utility Office Building (RLUOB) Federal Operational Readiness Review (FORR). This review represents the final step prior to commencing the startup of Hazard Category-3 (HC-3) nuclear operations at the RLUOB. The FORR Team has recommended that RLUOB be allowed to commence HC-3 operations upon confirmation of the adequacy of the corrective action plan and verification of closure of all pre-start corrective actions. Elevating RLUOB to a HC-3 nuclear facility includes development and implementation of a new safety basis conducting two operational readiness reviews: the FORR and a Contractor Operational Readiness Review, which was completed in February. A Management Self -Assessment (MSA) was completed in November 2021.

While the team has work to do to obtain authorization to startup as an HC-3 facility, reaching this point represents an incredible amount of work by a large interdisciplinary team from the following directorates:

- Weapons Production
- Chemical, Earth and Life Sciences
- Physical Sciences
- Environment, Safety, Health, Quality, Safeguards and Security
- Plutonium Infrastructure
- Capital Projects
- Facilities & Operations

Moving forward, the RLUOB is on track to be approved for HC-3 operations in Q4 FY2022.

David Teter Takes Helm of Capital Projects Amid Merger

On May 2, 2022, David Teter became the new associate Laboratory director for Infrastructure and Capital Projects (ALDICP), which was named to reflect the recent merger of two organizations. He is responsible for the leadership, management, oversight, strategic planning, and execution of the Laboratory's portfolio of construction projects.

ALDICP consolidates infrastructure program and planning responsibilities within the Weapons Infrastructure and Planning Office (WIPO) and the Infrastructure Program Office (IFPROG) to create a focal point and improve integration of program, planning, and execution of infrastructure projects across the Lab.

Teter holds a doctorate in metallurgical engineering from the University of Illinois Urbana-Champaign. Starting in 1997 as a technical staff member in MST-6, Teter built his career at the Laboratory around materials science. He was the recipient of Awards of Excellence for the Nuclear Weapons Program and Stockpile Stewardship Program in 1999, 2000, 2001 and 2004.

Most recently, he served for two years as the director of the Weapons Infrastructure and Planning Office, where he was responsible for funding the operations, maintenance, and modernization of the Lab's nuclear, high explosive, and specialized weapons facilities.

Eight Los Alamos National Laboratory Teams Honored for Excellence

Eight Los Alamos National Laboratory teams were recognized with the 2020 Defense Programs Awards of Excellence in a special ceremony at the Lab on May 18, 2022. Because the original award ceremony was delayed because of COVID-19, many of the recipients were reuniting with team members they had not seen since their 2020 successes.

Brig. Gen. Stacy Jo Huser, the Principal Assistant Deputy Administrator for Military Application at the National Nuclear Security Administration, was on hand to honor the awardees. She assists Dr. Marvin Adams, Deputy Administrator for Defense Programs, with maintaining the safety, security, and effectiveness of the nation's nuclear weapons stockpile.

Since 1982, the Office of Defense Programs has recognized team contributions that constitute significant achievements in quality, productivity, cost savings, safety, or creativity in support of the National Nuclear Security Administration's nuclear weapons program.

The winners are:

- Pete Kendall and the Canned Subassembly Accelerated Aging Team, which developed a new technology and methodology to help address aging concerns in weapon systems.
- Michael Peters and the W88 Alt 370 Nuclear Explosive Package QER and FPU Achievement Team, which completed a quality engineering release and achieved a nuclear explosives package first production unit (FPU) of the W88 Alt 370 in March 2020.
- Hannah Wood and the LANL New Employee Training Academy Team, which established a New Employee Training team to onboard and train new Weapons Production employees.
- Steven Schreiber and the LANL Review and Technical Assessment of the Proposed Savannah River Plutonium Processing Facility (SRPPF) Conceptual Design Package Team, which performed a technical peer review of the Savannah River Plutonium Processing Facility project to support submission of the critical decision 1 package.

Exceptional achievement award winners are:

- Gregory Chavez and the B61-12 LEP Design Review and Acceptance Group (DRAAG) Team, which passed the DRAAG milestone — the final review of the weapon system by a Department of Defense panel, and is the major milestone for the acceptance of a weapon system into the stockpile. This team received Exceptional Achievement recognition.
- Amy Wong and the CMRR PF-4 Equipment Installation Phase-1 Team, which transitioned operations from a line-item construction project to facility and programmatic groups 15 months ahead of schedule and more than $100 million under budget. This team received Exceptional Achievement recognition.
- Joe Watts and the Raiders of the Lost Archive Team, which facilitated the transfer of the Rocky Flats archives (hundreds of boxes of classified technical data, reports, laboratory notebooks, procedures, and illustrations) from the Denver Federal Center to Los Alamos. This team received Exceptional Achievement recognition.
- Tommy Morris and the Trinity Exception Evaluation Team, which drafted the B61-12's Major Assembly Release document, that was required for the Design Review and Acceptance Group milestone. This team received Exceptional Achievement recognition.

LAP4 D&D Subproject Removes First LAP4 Glovebox from the Plutonium Facility

The Los Alamos Plutonium Pit Production Project's Decontamination & Decommissioning (D&D) subproject team removed the first LAP4 glovebox from the Plutonium Facility on May 5, 2022, a significant accomplishment that marks the project's transition from planning to field execution.

The glovebox, which was never used for production operations, was free released for reuse, and is currently staged for reinstallation in a training location to serve its next purpose as a hands-on training tool for incoming work teams, an institutional gain for the entire workforce.

Removing the glovebox required careful collaboration among Plutonium Infrastructure D&D management, supervision, craft members, radiological control, PF-4

operations, Nuclear Process Infrastructure, and security personnel, as well as deployed service providers. Throughout the glovebox removal process the team executed the work as planned following good conduct of operations and disciplined operations; as a result, the team is now well-poised to build upon this success as it moves forward with the removal of the next two gloveboxes, which will also be repurposed for training.

LAP4 Equipment Subproject Successfully Completes Safety Review

During the week of April 25, 2022, a team of Department of Energy subject matter experts completed a technical independent project review (TIPR) of the Los Alamos Plutonium Pit Production (LAP4) 30-Base subproject. The purpose of the subproject is to procure and install the enclosures and equipment required to achieve a 30-pits-per-year base capacity at the Plutonium Facility (PF)-4.

The primary focus of a TIPR is to verify integration of safety into design, ensuring the 30-Base equipment will perform required safety functions while in use. Completing a TIPR is a prerequisite to downstream reviews that are required to establish a performance measurement baseline (PMB), including the external independent review (EIR) scheduled for this fall. The TIPR team provided productive feedback regarding some aspects of the safety management program's (SMP's) requirements flow down, the design review process, integration of 30-Base, PF-4, and SMPs, and how the effort could be strengthened and improved. Observers from the Savannah River Plutonium Processing Facility also participated in the review to take lessons learned back to their respective teams.

While the review team was on-site, they also reviewed the overall status of the LAP4 project and how the effort is progressing. The team was complimentary of the creation of the Associate Laboratory Directorate for Plutonium Infrastructure and the significant progress that has been made in the first year since achieving Critical Decision-1 one year ago.

The TIPR provided its formal report for factual accuracy review on May 20. LAP4 is now performing the factual accuracy review, comparing feedback from the APM Independent Assessment and developing corrective action plans.

Modernized Water Treatment Facility Will Handle Rad Waste Safely

The Laboratory recently hired contractors Hensel Phelps and JB Henderson Construction to build a key facility within a modernized water treatment complex at TA-50. Ground is expected to be broken in early summer.

The contractors will build the Transuranic Liquid Waste Facility (TLW), which will treat liquid waste from the TA-55 Plutonium Facility. It is a 5,100-square-foot tank farm with complex chemistry and complex mechanical systems.

Collecting, storing, treating, and discharging radioactive liquid waste in a safe, reliable, and effective manner is a critical responsibility of the Laboratory. This has been performed for several decades in the existing Radioactive Liquid Waste Treatment Facility (RLWTF), which is nearing the end of its functional life.

The Radioactive Liquid Waste Treatment Facility Upgrade Project involves replacing the Lab's existing radioactive liquid waste treatment capability with two new facilities. In support of the Lab's primary missions, the complex will consist of TLW and the Low-level Liquid Waste Facility (LLW). Completed previously, the LLW will treat liquid waste from most Laboratory sources except the TA-55 Plutonium Facility.

The Pacheco Building in Santa Fe Opens for Use, Provides Continuity of Operations

The Pacheco Building in Santa Fe is open for business after receiving its certificate of occupancy on May 10, 2022. The building was designed to be a drop-in work location for employees who live in the Santa Fe area and Albuquerque metro, reducing commute time and traffic to Los Alamos. The space will provide continuity of operations for those whose primary work location is from home, offering work or meeting space when needed.

The building is home to ALD Capital Projects offices, ALD Business Management Services offices, and an EasyIT tech desk and store. Shredding, printing, and office supplies are also available.

Located at the corner of Pacheco Street and St. Michael's Drive — at 2025 South Pacheco Street — the

Pacheco Building has 24 reservable workstations, three private offices, and several conference rooms.

There is one conference room for six people, one conference room for 18 people, and one conference room for 28 people. The conference rooms are available to anyone with a Z number and are reservable via employees' Outlook; institutional workstations and private offices are available to anyone with a Z number and are reservable via the workspace reservations system, Archibus.

Response to Cerro Pelado Fire was Part of Multi-Year Effort

The Cerro Pelado wildfire burned near the Laboratory and Los Alamos townsite. The fire was over 43,000 aces and was approximately three miles southwest of Laboratory property. Firefighting assets were pre-positioned to assist the Los Alamos Fire Department and other agencies to protect Laboratory facilities. Some of those assets included: a U.S. Forest Service helicopter, a 20,000-gallon water dip tank, Laboratory water tankers, and heavy equipment to assist with fire lines. Wildfire mitigation activities underway include:

- Establishment of defensible perimeters by thinning vegetation around sensitive areas;
- Clearing of dead trees;
- Ensuring that potential fuels remain at knee height or below;
- Mulching vegetation; and
- Strict control and minimization of combustible materials.

All Transuranic waste is stored in authorized facilities and protected against wildfire, including waste stored at TA-55 and the Transuranic Waste Facility. All tritium-related waste is stored in a safe configuration in the Weapons Engineering Tritium Facility (WETF). Building on lessons learned from the Las Conchas fire, the Laboratory has reduced fuel loads by over 3,500 tons in the last three and-a-half years.

Teams Prioritize Safety and ConOps as They Return PF-4's Wet Vac System to Operations

On Tuesday, May 3, 2022, a large team executed the removal of solution from the trap tanks in the 400-area of the Plutonium Facility. This was one of the last steps in return to the wet vac system to operation. The team consisted of approximately 20 personnel from Actinide Materials Processing & Power and Radiological Protection, with support from Facilities & Operations Engineering/Criticality Safety. The work entailed entering a contaminated area, draining the tanks into bottles, and transferring the bottles through multiple locations along the trolley to their final destination for disposition. An initial pre-job was conducted the day before in the PF-1 Auditorium with a diagram of the work, outlining the steps, and discussing what could go wrong and what must go right. Just before the work was executed, another pre-job was conducted to ensure personnel were ready and understood their roles and responsibilities. After the initial execution, a lessons learned session was conducted to discuss the process and any ways to perform the work in a safer, more efficient manner before they conducted the operation again to complete the removal. Work was planned and executed with excellent conduct of operations compliance and going above and beyond to take responsibility for safety.

Warehouse Supporting Pit Production Receives Certificate of Occupancy

On May 11, 2022, the Weapons Production (ALDWP) warehouse at TA-46, which is used by ALDWP and the Associate Laboratory Directorate for Plutonium Infrastructure (ALDPI) to execute work in support of the pit mission, received its final Certificate of Occupancy (COO).

The Laboratory was issued a Statement of Work (SOW) for all outstanding deficiencies identified during the original project completion by the U.S. Army Corps of Engineers. The scope included Laboratory Engineering to support in Title I (design), Title II (supervision and inspection), and Title III (construction management documentation) services. ALDPI requested Construction Management support for the project during Title II and Title III activities to obtain the COO. This included:

- Completion of outstanding tests performed on the emergency lights of the facility;
- Code corrections on the exterior ADA handrails;
- Anchoring the ADA handrails in accordance to the updated design;
- Connection/communication to the building automated system for the gas meter, fan coil, and electric meter to the facility; and

- Obtaining inspections for fire rated penetrations previously missed by the project prior to closeout.

Team members adhered to safe work practices as they assisted in destructive testing activities, non-destructive testing, and onsite visits to capture any field changes encountered. The Construction Management team worked alongside Laboratory craft workers to install and inspect the work performed in the field per the SOW.

Through teamwork, constant motivation, and keeping focus on disciplined operations, the team completed the SOW deficiencies and obtained the COO required to continue mission-critical work.

Woman Engineer Magazine Names the Lab Among "Top 20 Government Employers"

Los Alamos National Laboratory is one of 20 government agencies in the U.S. to make this year's 31st Annual "Top 20 Government Employers" in *Woman Engineer Magazine*.

Woman Engineer Magazine has ranked the Lab among the highest-ranking DOE national laboratories since 2017; the Lab is up one spot from 2021 and is the highest ranked DOE national laboratory in the spring 2022 edition.

Launched in 1979, *Woman Engineer Magazine* is the most widely read recruitment magazine for women engineers in the nation.

World Procurement Award Finalist

World Procurement Awards (WPA) has recognized the Lab as a finalist in its "Supply Chain Digitalization Delivering Agility, Capability, and Excellence in Digital Impact" category.

WPA is recognized as the pinnacle of professional achievement, celebrating the individuals, teams, and organizations in procurement. Award winners will be announced at an awards ceremony at the InterContinental Hotel in London on June 15, 2022.

COMMUNITY RELATIONS

Employee Food Drive Donates 233,527 Meals to The Food Depot to Help Northern New Mexicans Across Nine Counties

Los Alamos National Laboratory employees donated $57,648 and 587 pounds of food to The Food Depot as part of their annual food drive, providing 233,527 meals to northern New Mexicans. Lab employees increased their donations by more than 40 percent over 2021.

Headquartered in Santa Fe, The Food Depot serves nine counties in Northern New Mexico: Colfax, Harding, Los Alamos, Mora, Rio Arriba, San Miguel, Santa Fe, Taos, and Union; it offers food to persons experiencing food insecurity through strategic programs and a network of 81 nonprofit hunger relief partners at more than 140 locations across northern New Mexico. The Food Depot addresses the crisis of hunger through a combination of mobile client-choice pantries, after-school meal programs, drive-through food distributions, and support of a network of over 80 nonprofit organizations with a food-security focus.

During FY21, The Food Depot provided an average of 737,627 meals each month to people experiencing food insecurity, including the most vulnerable of our community — children, seniors, working families, and those in ill health.

Laboratory Leaders Present at ETEBA Federal Business Opportunities Forum

Business leaders in energy, technology, and environmental fields heard about Los Alamos National Laboratory's future growth and associated business opportunities directly from Lab leaders April 28, 2022 through the Federal Business Opportunities Forum held at Hilton Buffalo Thunder resort in Pojoaque that was organized by the Energy Technology and Environmental Business Association (ETEBA).

The first in-person ETEBA Forum in three years was kicked off by keynote speaker and Laboratory Director Thom Mason. He emphasized the Lab's role in continued nuclear deterrence in the world today, as well as the Lab's contributions to bioscience research and involvement in developing the COVID-19 vaccine.

Deputy Laboratory Director of Operations Kelly Beierschmitt spoke next about the opportunities to support growth at the Lab. Beierschmitt defined the Lab's long-term challenge of meeting its mission deliverables — achieving its $4 billion cost target in FY22 and onboarding 4,000 new employees in the next two years — and he challenged the audience of small business owners, subcontractors, and suppliers to help.

Brad Westergren, procurement manager for the Lab's Acquisition Services Management division, presented as a panelist about procurement programs and opportunities at Los Alamos and other National Nuclear Security Administration laboratories across the country. The Lab's Project-Program Director Brock Trubiano informed attendees about future capital projects at the Lab such as construction and road work along the Pajarito corridor. He encouraged those in the audience to submit bids for the upcoming work, which are announced on the Lab's website.

Laboratory-Supported Math Teacher Leader Network Meets for Two Cross-School Collaboration Sessions in Northern New Mexico

This March and April, 2022, all the teachers and principals currently in the Laboratory-organized Math Teacher Leader Network (MTLN) program gathered together in schools for the first time this academic year to take their professional development to the next level.

The 32 teachers and four principals spent two days at Blanco Elementary in Bloomfield in March 2022 before reconvening at Mountain Elementary in Los Alamos for two days in April 2022.

The Math Teacher Leader Network is an association of the Laboratory's MSA, math teacher leaders and their principals that is designed to facilitate and strengthen high-quality mathematics teaching and learning in elementary and middle schools in northern New Mexico.

The cross-school collaboration allowed the whole group to come together to plan and observe lessons, and provide feedback that could be incorporated into updated lesson plans. The collaborative planning-observation-feedback-revision approach also works with other subjects beyond mathematics.

The teachers and principals taking part were from Bloomfield Public Schools, Los Alamos Public Schools, Pojoaque Valley School District, and Santa Fe Public Schools.

Triad Pledges $50,000 for New Mexico Wildfire Relief, Volunteers Distribute Food

Laboratory operator Triad will be making an initial contribution of $50,000 to the All Together New Mexico Fund to provide relief to those affected by the wildfires in Northern NM. The support will go to emergency shelter, food and water distribution, and other critical services.

In addition, Triad will also match employee contributions to nonprofit organizations supporting wildfire relief efforts in the region.

On May 19, 2022, a dozen LANL volunteers joined the Food Depot at the Española Valley High School to distribute free food to individuals and families who have been impacted by the wildfires in Northern New Mexico. The pop-up food pantry distribution was part of a wildfire response effort from the State, the Food Depot and other local agencies.

The volunteers provided food to 148 households (for a total of 369 people), distributing shelf-stable pantry bags (canned/packaged proteins, soups, vegetables), produce boxes (fresh fruits and vegetables), frozen chicken, bread, and prepared sack lunches.

Weapons Engineering Volunteers Support Local STEM Festival

Laboratory volunteers from the Associate Laboratory Directorate for Weapons Engineering (ALDW) helped students from Carlos F. Vigil Middle School in Española take part in a morning of challenging and fun math activities during a recent Julia Robinson Math Festival (JRMF) event at Santa Fe Community College (SFCC).

JRMFs, which take place all over the world, offer students advanced and thought-provoking mathematics in a social and cooperative atmosphere. Students choose among several tables offering problem sets, games, or puzzles with mathematical themes. Participants work as long as they want, while a facilitator provides support and encouragement. Motivation comes from social interaction, rather than from any prize, grade, medal, or ranking. In Santa Fe, activities included math and logic puzzles such as Skyscrapers (a

form of 3-D sudoku) and Wolves and Sheep (a strategy game played on a modified checkerboard).

SELECTED MEDIA COVERAGE

A Quantum Sense for Dark Matter
Science, Adrian Cho (4/28)
To detect dark sector particles with masses as low as 1/100,000th that of a proton, [silicon] would need to unleash an electron when pinged by a photon of just 0.03 eV. So Kahn, Abbamonte, and colleagues at Los Alamos National Laboratory are exploring "narrow bandgap" semiconductors such as a compound of europium, indium and antimony.

'LightSlinger' Antenna is Small, Versatile, and Efficient
What's New in Electronics (4/28)
As wireless communications technology continues to advance, the need for smaller, more versatile, more energy- and cost-efficient antennas is becoming increasingly important. Now scientists and engineers at Los Alamos National Laboratory have developed a new type of antenna, called LightSlinger, to meet this need.

New Weapons Executive Officer at Los Alamos
Exchange Monitor, Dan Leone (4/28)
Los Alamos National Laboratory appointed Evelyn Mullen executive officer for weapons, the New Mexico nuclear-weapons design laboratory announced Monday.

Mars's Soundscape is Strangely Beautiful
The Atlantic, Marina Koren (4/29)
We have decades' worth of images, but to hear the natural sounds that go with them is "a really visceral experience," [said] Nina Lanza, a planetary geologist at Los Alamos National Laboratory who works on the Perseverance rover.... "We can at once feel that it's extremely familiar in some ways, but also weirdly alien in ways that it's a little hard to put your finger on," she said.

How 'Good Fires' Can Turn into Wildfires
Albuquerque Journal, Theresa Davis (4/30)
LANL worked with the Forest Service to develop the FIRETEC tool, which models the shape and growth of wildland fires and prescribed burns.

Los Alamos National Laboratory: Bioplastics Point Way to Environmentally Sustainable, Green Future
Los Alamos Daily Post (4/30)
Getting a grip on climate change depends on shifting from CO_2-emitting fossil fuels to renewable energy sources. When that happens, where will we get all the plastic we need for, well, nearly everything?

LANL Foundation Celebrates an Anniversary — and Success
Santa Fe New Mexican, Jenny Parks (5/1)
Twenty-five years ago, leaders at Los Alamos National Laboratory, the University of California, the Department of Energy and Los Alamos Public Schools (with support from members of the New Mexico congressional delegation) decided to create an independent 501(c)(3) nonprofit foundation that would supplement the educational programs of school districts in counties near the lab.

Business People
Santa Fe New Mexican, Teya Vitu (5/2)
Evelyn Mullen is the new executive officer of the Weapons directorate at Los Alamos National Laboratory. She previously was the chief operating officer in Global Security at LANL. Mullen has worked at the lab since 1992. She has bachelor's and master's degrees in nuclear engineering from Texas A&M University.

Wintertime Flow of Blood Falls Caught on Camera for the First Time: Scientists are Trying to Pinpoint Why the Unusual Waterfall Flows When It Does
Antarctic Sun, Lauren Lipuma (5/2)
"There's a lot of parts of the system that we know, but we still don't know what that actual initial triggering event is, of why now and not some other time," said Chris Carr, a glaciologist at Los Alamos National Laboratory and lead author of the new study.

What is Heliopause? All about our turbulent border with interstellar space
Interesting Engineering, John Loeffler (5/4)
"Just as bats send out sonar pulses in every direction and use the return signal to create a mental map of their surroundings," Dan Reisenfeld, a scientist at Los Alamos National Laboratory and the lead author of a paper published in Astrophysical Journal in 2021 that presented the first detailed 3D map of the heliopause, explained, "We used the Sun's solar wind, which goes out in all directions, to create a map of the heliosphere."

President Declares Disaster in New Mexico Wildfire Zone
Associated Press, Cedar Attansio and Susan Montoya Bryan (5/5)
Firefighters slowed the advance of the largest wildfire in the U.S. as heavy winds relented Wednesday, while President Joe Biden approved a disaster declaration that brings new financial resources to remote stretches

of New Mexico devastated by fire since early April.... Officials at Los Alamos National Laboratory were warily tracking another wildfire that crept Wednesday within about 5 miles (8 kilometers) of facilities at the U.S. national defense laboratory based in Los Alamos.

History of Wildfire Threats Prepares Los Alamos National Lab

KOB TV, Brett Luna (5/7)

Over the past three to four years, the lab has been reducing the overall fuel load in the priority high fire risk areas. "We reduced the fuel load at the laboratory by about 35 hundred tons in the last 3 and a half years," said [Jim] Jones.

Magnetic Impurities Turn Quantum Dots into Emitters of Free Electrons

Los Alamos Daily Post (5/9)

Incorporating magnetic ions into colloidal quantum dots enables them to convert light into a stream of free electrons. This effect could benefit numerous technologies, from solar photochemistry and night-vision goggles to advanced accelerators and free-electron lasers.

Pianist-Engineer Putting Dramatic Coda on Rose Years

Tribune Star, Mark Bennett (5/10)

Upon graduating, a job awaits Romano at Los Alamos National Laboratory in New Mexico. He's anxious to delve into aerospace, theoretical and research work, and emphasized, "I do really enjoy engineering."

Winds of Change: LANL Scientists are Developing Wildfire Tools for the New Climate

Santa Fe Reporter, Julia Goldberg (5/10)

As wildland fires across New Mexico erupted in April—growing in size and scope as intensive winds rattled the state—Los Alamos National Laboratory research scientist Adam Atchley's pervading thought was and continues to be: "We are watching climate change unfold. And we're seeing it happen in fire behavior."

Earthquake and Tsunami Prediction Enhanced by Deep-Learning Model

Engineering and Technology, Beatriz Valero de Urquia (5/12)

A team of scientists at Los Alamos National Laboratory is working on a solution for predicting natural disasters, starting with earthquakes and tsunamis. To achieve this, they have developed a deep-learning model able to pick up on the gravity waves generated by an earthquake and thus predict the risk of an ensuing tsunami.

Why the Department of Energy Wants $463 Million for Nuclear Waste Facility Near Carlsbad

Carlsbad Current Argus, Adrian Hedden (5/12)

Los Alamos is one of two DOE sites, along with the Savannah River Site in South Carolina, tasked with increasing the production of plutonium pits – the triggers for nuclear bombs – in the coming years. The project was intended to modernize the U.S. nuclear stockpile. That will mean more nuclear waste to be disposed of, and the DOE asked for a 47 percent increase in Los Alamos' budget from $226 million last year to $331 million in FY 2023.

Wildfire Puts Los Alamos National Lab on Evacuation Standby

Axios, Russel Contreras (5/12)

If evacuations are ordered for Los Alamos, LANL facilities would be placed on a standardized "safe shutdown" process to ensure the safety and security of each building, according to its procedures and materials on hand.

Governor Pays Quiet Visit to Los Alamos Thursday Afternoon

Los Alamos Reporter (5/13)

Gov. Michelle Lujan Grisham visited the Los Alamos National Laboratory Emergency Operations Center Thursday with LANL leadership.

Menaced by Flames, Nuclear Lab Peers into Future of Wildfire

Associated Press, Morgan Lee (5/13)

People who remained on alert to prepare for evacuations west of Santa Fe included scientists at Los Alamos National Laboratory who are tapping supercomputers to peer into the future of wildfires in the U.S. West, where climate change and an enduring drought are fanning the frequency and intensity of forest and grassland fire.

County and Lab Return to 'Ready' — Caution Fire Not Yet Out

Los Alamos Daily Post, Kirsten Laskey (5/16)

Los Alamos National Laboratory announced its return to "ready" in the Ready, Set, Go procedure and effective Tuesday morning, so will the County.

Validation Brings New Predictive Capability to Global Megafire Smoke Impacts

Phys.Org (5/16)

A Los Alamos National Laboratory–led team modeled the behavior and impacts of smoke as it rose from the lower atmosphere into the high-riding stratosphere,

then circulated the globe. The research appeared in the *Journal of Geophysical Research—Atmospheres*.

Assessing the Potential Impact of River Chemistry on Arctic Coastal Production
Frontiers in Marine Science (5/17)
The High-Latitude Application and Testing of Earth System Models (HiLAT) project, based at Los Alamos National Laboratory, developed a model for high latitudes based on version zero of E3SM.

COVID Cases Now Rising Across NM in Part Because Fewer People Wear Masks Indoors, LANL Scientists Say
News From the States, Austin Fisher (5/17)
Most people in New Mexico are now living in areas with climbing rates of new cases of COVID-19, according to the latest modeling by scientists at Los Alamos National Laboratory.

Los Alamos National Laboratory to Participate in Domestic Atmospheric Radiation Measurement Campaigns
LA Daily Post, Carol Clark(5/17)
The Department of Energy National Nuclear Security Administration's Los Alamos Field Office (DOE/NNSA) has issued a Categorical Exclusion for Domestic Atmospheric Radiation Measurement Campaigns-Eastern Pacific Cloud Aerosol Precipitation Experiment (EPCAPE).

Satellite- and Ground-Based Observations of Australia and British Columbia Blazes Help Increase Resolution of Models
ScienceDaily, Addrew Shawn (5/17)
Using that data for validation, a Los Alamos National Laboratory-led team modeled the behavior and impacts of the smoke as it rose from the lower atmosphere into the high-riding stratosphere, then circulated the globe. The research appeared in the *Journal of Geophysical Research — Atmospheres*.

Director Thom Mason and Los Alamos County Council Chair Randall Ryti Speak at Cerro Pelado Fire Base Camp
Los Alamos Reporter (5/18)
Los Alamos County Council Chair Randall Ryti and Los Alamos National Laboratory Director Thom Mason spoke to Cerro Pelado Fire team members at a Tuesday morning briefing at the Cerro Pelado base camp. A poster made by Los Alamos Public School students with dozens of message of gratitude to firefighters working on the Cerro Pelado Fire was on display. Photo by Chief Troy Hughes/LAFD

Supercomputing History Unveiled at LANL's Bradbury Science Museum
HPC Wire (5/18)
A diverse crowd of computing experts and enthusiasts gathered at the Bradbury Science Museum recently to celebrate the opening of a revamped supercomputing exhibit.

Amid Severe Drought, Former Interior Secretary Calls for Revamping Colorado River Pact
Los Angeles Times, Ian James (5/19)
In a study published last month, scientists at Los Alamos National Laboratory projected that climate change will bring large losses of snowpack in the Rocky Mountains, where much of the river's flow begins as melting snow and rain.

Hydrogen Fuel Cells Expected to be Used for Large Vehicles and Vessels
Business Korea, Jung Min-hee (5/20)
The Korea Institute of Science and Technology (KIST) announced on May 19 that the Los Alamos National Laboratory and itself developed a technique with which the performance of polymer electrolyte fuel cells at high temperature and zero humidity can be maintained even without such additional systems.

R&D 100 Winner of the Day: CICE
R&D World, Heather Hall (5/20)
Los Alamos National Laboratory's CICE is a computational model that represents changes to sea ice and its interactions with the polar environment and ecosystems.

Two Pojoaque Valley Intermediate School Teachers Receive $1,000 Grants from LANL Foundation and Centerra
Los Alamos Reporter(5/20)
Pojoaque Valley Intermediate School teachers April Grant-Torrez and Michelle Sanchez were recently honored with $1,000 awards from the Los Alamos National Laboratory Foundation and Centerra. Grant-Torrez teaches fourth grade; Sanchez teaches fifth.

What Would Music Sound Like on Mars? We Spoke to a Planetary Scientist to Find Out
Classic FM, Sophia Hall (5/20)
Sound on Mars is altered due to three main differences; atmosphere, temperature, and density. We spoke to Dr Nina Lanza from the Los Alamos National Laboratory in New Mexico, United States, to find out more about how music would be affected on the red planet.

LANL Developing Software to Better Manage Prescribed Burns

Santa Fe New Mexican, Scott Wyland (5/21)

Los Alamos National Laboratory is developing a modeling tool that will aid fire managers in making prescribed burns more of an exact science.

State Removes Breakthrough Case Data from COVID Reports

Albuquerque Journal, Ryan Boetel (5/21)

"We're simply diagnosing more sick people who are seriously sick, and we're missing more of the people with mild illness," Paul Fenimore, a scientist at Los Alamos National Laboratory, said. "Those imperfections have the character of being a bias, so that you see sort of the bad side of the coin."

Pair of NASA Missions Will Help Planetary Defense

Santa Fe New Mexican, Wendy Caldwell (5/22)

At Los Alamos, we are interested in solid bodies for another application: planetary defense. If a large body were on an Earth-crossing path, the more we knew about the object, the more likely an Earth mission could prevent a catastrophic impact through deflection.

Exascale Computing Project Details ISC 2022 Participation

HPCwire (5/23)

When devotees of high-performance computing, machine learning, and data analytics meet in Hamburg, Germany, May 29–June 2 for the ISC High Performance 2022 conference, the US Department of Energy's Exascale Computing Project (ECP) will contribute at numerous sessions covering a variety of topics and provide chair and committee leadership. ECP researchers are also on the Research Papers committee. Under Performance Modeling, Evaluation, and Analysis is Scott Pakin (Los Alamos National Laboratory).

Weird Quantum State of Matter Observed for the First Time

SciTech Daily (5/23)

A near-perfect triangle of atoms enabled Bianchi and his team at UdeM to create magnetic frustration in Ce2Zr2O7. Working with researchers at McMaster and Colorado State universities, Los Alamos National Laboratory, and the Max Planck Institute for the Physics of Complex System in Dresden, Germany, they measured the compound's magnetic diffusion.

Earthquake Researchers Hope Artificial Intelligence Could Lead to Prediction Breakthrough

KTLA, Chip Yost and Travis Schlepp(5/24)

Some researchers, including those at Los Alamos National Lab in New Mexico, are hoping tools like artificial intelligence and machine learning could lead to a seismic breakthrough.

Eight Los Alamos National Laboratory Teams Honored with 2020 Defense Programs Awards of Excellence

Los Alamos Reporter, Maire O'Neill (5/24)

Eight Los Alamos National Laboratory teams were recognized with the 2020 Defense Programs Awards of Excellence in a special ceremony at the Lab on May 18.

Los Alamos Team Models Drought, Climate Change on the Colorado River

NM Political Report, Hannah Grover (5/24)

Scientists at Los Alamos National Laboratory modeled future drought indicators to gauge how climate change could impact the Colorado River Basin.